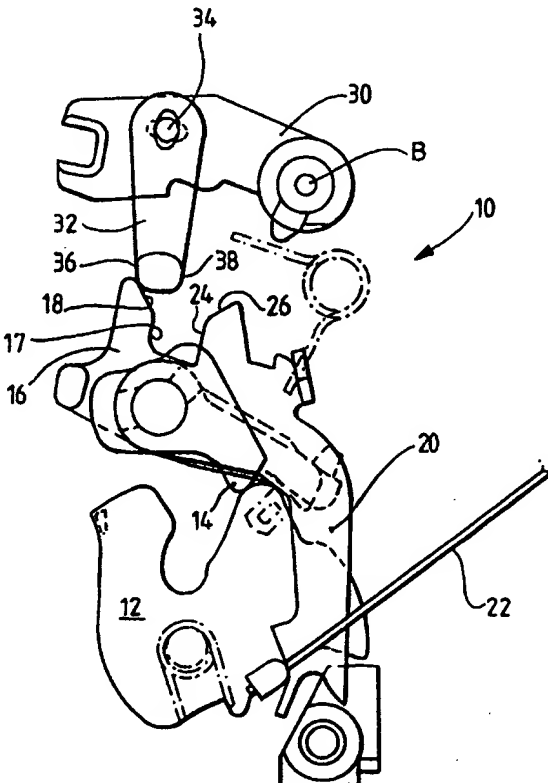




## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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<p>(21) International Application Number: PCT/GB99/03297</p> <p>(22) International Filing Date: 6 October 1999 (06.10.99)</p> <p>(30) Priority Data: 9821782.1 6 October 1998 (06.10.98) GB</p> <p>(71) Applicant (for all designated States except US): MERITOR LIGHT VEHICLE SYSTEMS - FRANCE [FR/FR]; 8, rue Sebastien Lehr, F-88104 Saint-Die Cedex (FR).</p> <p>(72) Inventors; and (75) Inventors/Applicants (for US only): MEJEAN, Veronique [FR/GB]; Meritor Light Vehicle Systems (UK) Ltd, Fordhouse Lane, Stirchley, Birmingham B30 3BW (GB). NOEL, Jean, Pierre [FR/GB]; Meritor Light Vehicle Systems (UK) Ltd, Fordhouse Lane, Stirchley, Birmingham B30 3BW (GB).</p> <p>(74) Agents: JONES, John, B. et al.; Withers &amp; Rogers, Goldings House, 2 Hays Lane, London SE1 2HW (GB).</p>		<p>(81) Designated States: IN, JP, KR, US, European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE).</p> <p><b>Published</b> With international search report.</p>
<p>(54) Title: DOOR LATCH</p> <p>(57) Abstract</p> <p>A door latch (10) including a latching means, a release lever (20) operable between a first closed position and a second released position, a pawl lifter (16) operable between a first closed position and a second released position, and a lock link (32) operable between a first locked and second unlocked position characterized in that the movement of the lock link (32) from the first locked position to the second unlocked position when the released lever (20) is in its second position and the pawl lifter (16) is in its first position causes unlatching of the latch means.</p> 		

## DOOR LATCH

The present invention relates to door latches and in particular to door latches for motor vehicles. Door latches are known which include a release lever operable between a first closed position and a second released position, a pawl lifter operable between a first closed position and a second released position, and a lock-link operable between a first locked position and a second unlocked position. With the lock-link in the second unlocked position operation of the release lever from the first closed position to the second released position causes the release lever to operate on the lock-link which in turn operates on the pawl lifter to move it from its first closed position to its second released position thus causing unlatching of latching means.

Clearly when the lock-link is in its first locked position and an attempt is made to open the latch by moving the release lever to its second release position unlatching does not occur. A subsequent attempt to unlatch the latching means requires the release lever to be returned to its first closed position, the lock-link to be moved to its second unlocked position and only then can the release lever be moved from its first closed position to its second release position to unlatch the door latch.

Thus according to the present invention there is provided a door latch including a latching means, a release lever operable between a first closed position and a second released position, a pawl lifter operable between a first closed position and a second released position, and a lock-link operable between a first locked and second unlocked position characterized in that movement of the lock-link from the first locked position to the second unlocked position when the release lever is in its second position and the pawl

lifter is in its first position causes unlatching of the latch means.

Preferably abutments on the lock-link engage with corresponding abutments on the pawl lifter and release lever so as to cam them (the pawl lifter and release lever abutments) apart to cause movement of the pawl lifter relative to the release lever to unlatch the latch means.

Preferably the lock-link is at least moved from its first locked position to its second unlocked position by an actuator. Preferably the lock-link is moved from its second unlocked position to its first locked position by the actuator. Preferably the actuator is an electrical actuator. Preferably the latch means is a latch claw.

The invention will now be described by way of example only with reference to the drawings in which:-

Figure 1 is a cut away view of a door latch according to the present invention with the release lever and pawl lifter in their respective first closed positions and with the lock-link in its first locked position;

Figure 2 is a view similar to figure 1 with the release lever in its second released position, the pawl lifter in its first closed position and the lock-link in its first locked position; and

Figure 3 is a view similar to figure 1 showing the release lever and pawl lifter in their respective second release positions and the lock-link in its second unlocked position.

With reference to figures 1 to 3 there is shown a latch assembly (10)

including a rotatable latch claw (12) which engages a pin or striker bar (not shown) of a door (not shown) in a known manner.

The latch claw (12) is held in a closed position (as shown in figure 1) by a latch pawl (14) acting on abutment (12A) when the associated door is in a fully closed position, and on abutment (12B) when the associated door is in a first safety position.

The pawl (14) is connected to a pawl lifter (16), rotation of pawl lifter (16) anti-clockwise as shown in figure 1 causing anti-clockwise rotation of the pawl (14) thus disengaging the pawl from the abutment (12A) or (12B) as appropriate to allow the associated door to open. In this case pawl (14) and pawl lifter (16) both rotate about axis A (see figure 3).

The latch assembly (10) also includes a release lever (20) which is also capable of pivoting about axis A and is connected, in this case via cable (22) to an outside door handle (not shown) of the associated door. Operation of the outside door handle causes movement of the release lever (20) from its first closed position as shown in figure 1 to its second release position as shown in figures 2 and 3. Release lever (20) includes adjacent abutment faces (24) and (26).

Pawl lifter (16) includes adjacent abutment faces (17) and (18).

Latch assembly also includes a lock-lever (30) pivoted about axis B. A lock-link (32) is pivotally connected to the lock-lever at pivot (34). Lock-link (32) includes abutments (36) and (38) on its opposite sides remote from pivot (34). Lock-lever (30) can be moved between a first locked position as shown in figure 1 and 2 to a second unlocked position as shown in figure 3

by an electrical actuator (not shown).

Similarly lock-link (32) being mounted on lock-lever (30) is moved between a first locked position as shown in figures 1 and 2 to a second unlocked position as shown eg.in figure 3.

Operation of the latch assembly is as follows:

With the various components positioned as shown in figure 1 the latch assembly is locked from opening via the outside door handle since operation of the outside door handle only causes the release lever to move between its first and second positions without affecting the pawl lifter. When the door is unlocked the lock-lever (30) is caused to rotate anti-clockwise thus moving abutments (36) and (38) of lock-link (32) to a position between abutments (17) and (24) of pawl lifter (16) and release lever (20) respectively (this position is not shown). Operation of the outside door handle causes the release lever to rotate about axis A which results in abutment (24) pushing on abutment (38) which in turn causes abutment (36) to push on abutment (17) causing rotation of the pawl lifter and hence disengagement of the pawl from abutment (12A) or (12B) as the case may be. During such unlatching operation the lock-link rotates about pivot (34).

However when the lock-link is in its first locked position and the outside door lever is actuated to move the release lever from its first closed position to its second release position, abutment (24) approaches but does not contact abutment (17), see figure 2. Under these circumstances abutments (36) and (38) are positioned between abutments (18) and (26). Subsequent operation of the electrical actuator to move the lock-lever and hence the lock-link from the first locked position to the second unlocked locked position

whilst the release lever remains in its second release position causes abutments (36) and (38) of the lock-link to force their way between the convergent gap formed by abutments (18) and (26). With the door lever held in the open position, the movement of the lock-link from its first locked position to its second unlocked position causes rotation of the pawl lifter (16) in an anti-clockwise direction thus releasing the door latch.

Subsequent release of the outside door handle will allow the release lever (20) and pawl lifter (16) to return to their first position with abutments (36) and (38) remaining between abutments (17) and (24) (since the lock-lever is still in its unlocked position).

It should be noted that reference to the lock-lever and lock-link being in a locked position means that abutments (36) and (38) cannot contact respective abutments (17) and (24) (see figure 1). Conversely when the lock-lever and lock-link are in an unlocked position abutments (36) and (38) are positioned between abutments (17) and (24) and this is the case irrespective of the position of the outside door handle. Thus the lock-link (32) can be in its second unlocked position with the release lever and pawl lifter in their respective first closed positions, and the lock-link can still be in a second unlocked position whilst the release lever and pawl lifter are in their respective second released positions.

The invention is particularly useful when used in conjunction with passive entry systems for automotive vehicles. Such passive entry systems operate as follows:

- A The vehicle is left in a locked condition with the lock-lever and lock-link being positioned in their first locked position.

- B     Operation of the outside door handle will activate the passive entry system whereby the system attempts to recognize the person operating the door handle eg. by identification means carried about their person.
- C     Should the system fail to recognise the person eg. by identification means not being present, then the lock-lever and lock-link remain in their first locked position.
- D     However should the system recognise the person eg. by the identification means being present, the lock-lever and lock-link are moved by the electrical actuator from the first locked position to the second unlocked position thus unlocking the door.

It should be noted that the unlocking operation can occur whether the release lever (20) is in its first closed position, second released position or any position intermediate these two extremes. In particular the invention enables unlocking of the latch irrespective of the speed of operation of the outside door handle or the speed of operation of the electrical actuator in moving the lock-link from its first locked position to its second unlocked position. This allows the door to be unlocked and unlatched with a single operating movement of the release lever (20), and in a preferred embodiment such unlocking and unlatching is achieved by a single actuator.

## CLAIMS

1. A door latch including a latching means, a release lever operable between a first closed position and a second released position, a pawl lifter operable between a first closed position and a second released position, and a lock link operable between a first locked and second unlocked position characterized in that the movement of the lock link from the first locked position to the second unlocked position when the released lever is in its second position and the pawl lifter is in its first position causes the lock link to co-operate with the release lever and pawl lifter such that the pawl lifter acts to unlatch the latch means.

2. A door latch as defined in Claim 1 in which abutments on the lock link engage with corresponding abutments on the pawl lifter and release lever so as to cam the pawl lifter and release lever abutments apart to cause movement of the pawl lifter relative to the release lever to unlatch the latch means.

3. A door latch as defined in Claims 1 or 2 in which the lock link is at least moved from its first locked position to its second unlocked position by an actuator.

4. A door latch as defined in any preceding claim in which the lock link is moved from its second unlocked position to its first locked position by an actuator.

5. A door latch as defined in Claims 3 or 4 in which the actuator



is an electric actuator.

6. A door latch as defined in any preceding claim in which the lock link is pivotally mounted on a lock lever.

7. A door latch as defined in Claim 6 in which the lock lever is pivotally mounted.

8. A door latch as defined in Claim 6 or 7 when dependent upon Claim 3,4 or 5 in which the lock lever is moved by the actuator to cause the lock link to move between its first and second positions.

9. A door latch substantially as herein described with reference to or as shown in the drawings.

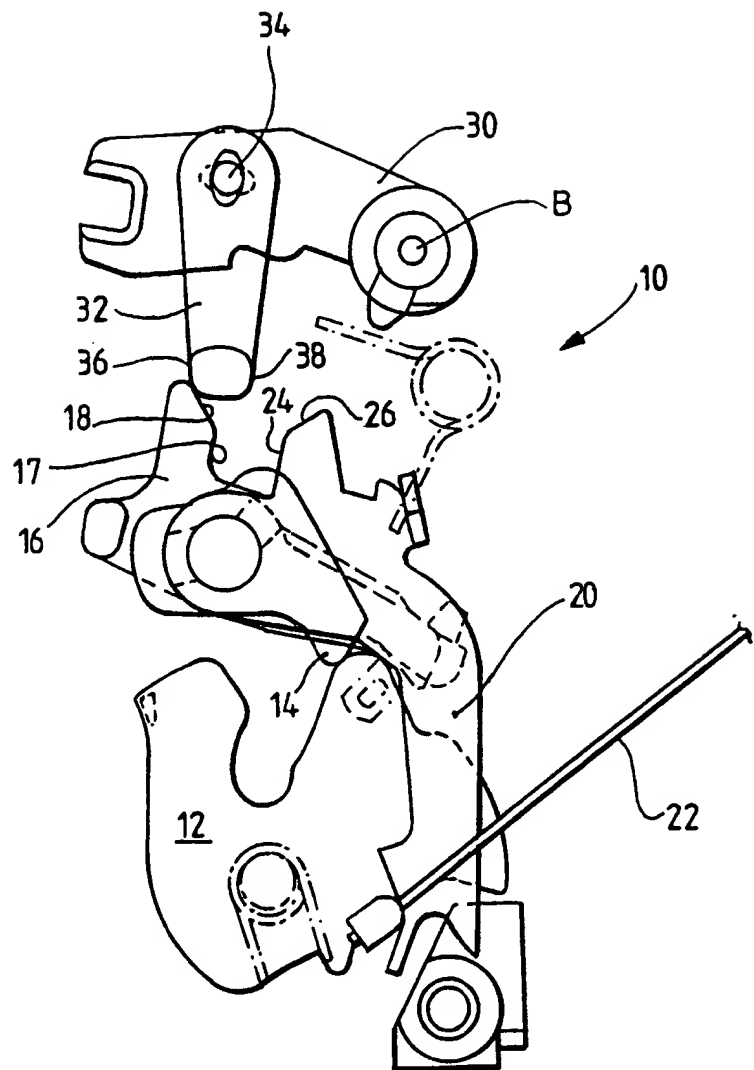


FIG.1.

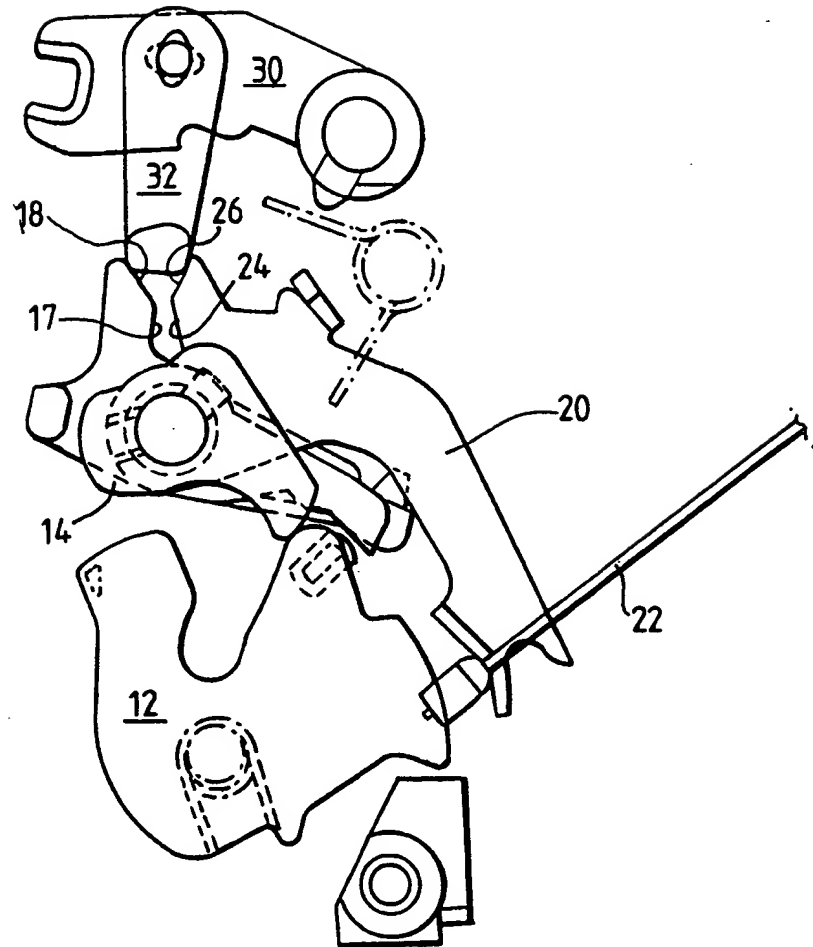


FIG. 2.

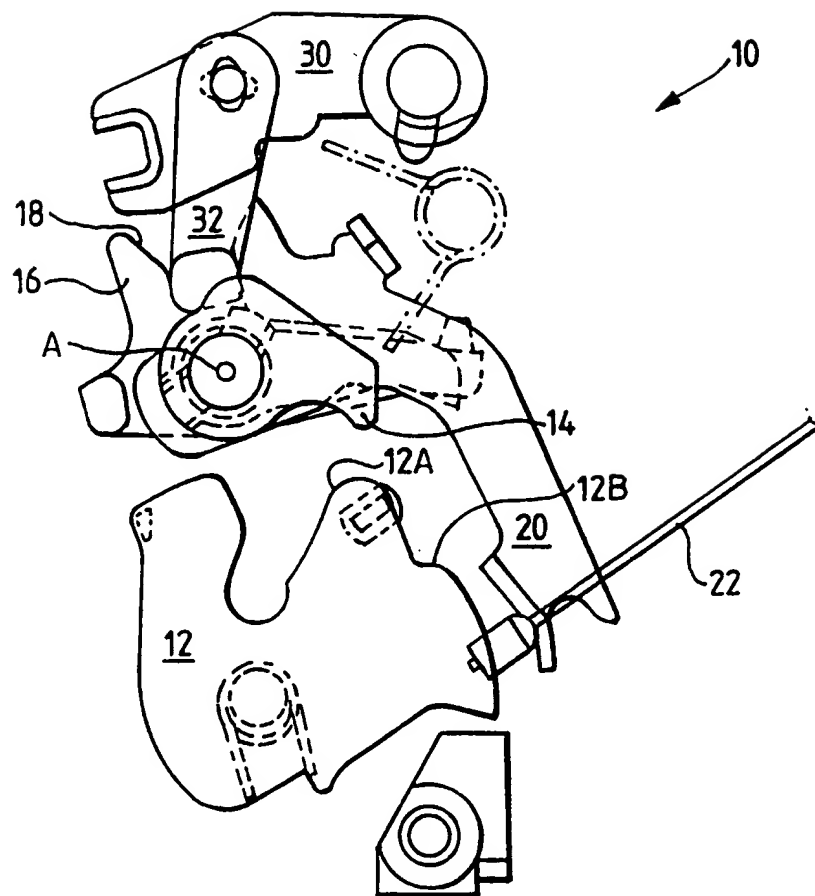


FIG.3.

# INTERNATIONAL SEARCH REPORT

International Application No

PCT/GB 99/03297

**A. CLASSIFICATION OF SUBJECT MATTER**  
IPC 7 E05B47/00 E05B65/20

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 E05B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	EP 0 834 631 A (GENERAL MOTORS CORPORATION) 8 April 1998 (1998-04-08) the whole document -----	1

☐ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

### \* Special categories of cited documents :

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Date of the actual completion of the international search

19 January 2000

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27/01/2000

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# INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/GB 99/03297

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 834631 A	08-04-1998	US 5803515 A	08-09-1998